

INDEX OF SUBJECTS

Abstracts, papers and (editorial), 1-2

Acetylcholine
as defibrillating agent, 25, 26
fibrillation induced by, 391-395
peripheral blood after, 366

Ac-globulin
platelet factor 1 differentiated from, 114
in prothrombin activation, 515

ACTH, see Corticotropin

Acthar-Gel, 264

Actomyosin
digitalis failing to affect, 226
quantitative extraction of from dog myocardium, 215-219
and ATP sensitivity, 217-219, 223-224, 226-227
spectrophotometric study of with drugs, 525-531

Adenosine monophosphate (AMP), in experimental arteriopathies, 374-377

Adenosine triphosphate (ATP)
and "coronary chemoreflex" (v. Bezold-Jarisch effect), 372, 373
as defibrillating agent, 25-27
in experimental arteriopathies, 374-377
in generation of bioelectric potentials, 431
hypotensive action of, 371, 372
-sensitivity of actomyosin, 217-219, 223-224, 226-227
spectrophotometric absorption of, 525-526, 529-530

Adrenalectomy
bilateral, hypotensive action of, 461
and ECG response of rat to ouabain, 281-283

Adrenalin, see Epinephrine

Albumin, iodinated serum
cardiac output measured by, 564-568
disappearance curve of, 15-17, 19-23
indigo carmine curves compared with, 572, 573

Alcohol, ethyl, in pulmonary edema, 510-513

Ambonestyl, antiarrhythmic effects of, 335-342
vs. procaine amide, 336, 338-341

American Heart Association
awards, 645
Basic Science Section, 119-120
"Cardiac Clinics" (audio-visual kit), 316
"Cardio-Views" (kit), 316
"Cine-Angiograms for Teaching," 117
Community Service and Education, Council on, 315-316
"Congenital Heart Defects, Diagnosis of" (manual), 230
"Diseases of the Heart and Blood Vessels" (manual), 230
Gold heart awards, 646
grants in aid, 229, 426
deadline, 316, 426, 544
Halsey, R. H. (obit.), 647
Heart Fund campaign, 117
High Blood Pressure, Council for
meeting, 544
officers elected, 117-118
Proceedings volume, 544
"Jones Criteria (modified) in Diagnosis of Rheumatic Fever," 646
Jones, T. Duckett, Memorial Fund, 646
"Prevention of Rheumatic Fever and Bacterial Endocarditis," restatement on, 229
Registry of Cardiovascular Pathology, 544-545
Scientific Sessions, New Orleans, 230, 315, 427, 543-544
training program in cardiovascular research, 229
work, exercise and heart disease, study of, 545

American Society for the Study of Arteriosclerosis, 118

Amino acids
serum vs. connective tissue (rat), 521, 522, 523
spectrophotometric identification of, 528

Ammonium chloride, in ventricular contraction recovery with glucose, 561-562

Anastomoses, interarterial coronary, role of anemia in, 307-310

Aneurysm, experimental "berry," jet action in, 463-467

Angiotonin, and vasoactivity, 122, 123

Anticoagulant(s)
antiheparin activity of platelet factor 4, 113, 115
antithrombin as, 401
with heparin, 402
see also Heparin

Aortic strips, elasticity and damping of (dog), 403-408

Arrhythmias
ambonestyl for, 335-342
cyclopropane-epinephrine, drugs influencing, 291
ouabain-induced, calcium and potassium in, 501, 504
procaine amide for, 336, 338-341, 475, 476
see also Fibrillation

Arterenol
and blood volume, "central," of dog, 385-389
in meningococcal hypotension, 380-381
and vasoactivity, 122, 123, 125, 127-128

Arteriosclerosis
American Society for Study of, 118
epinephrine-thyroxin induced, ATP, AMP and heparin in, 374-377
Minnesota symposium on, 427-428
histopathology of, 154
related to blood flow and pressure, 152, 154-158

Ascites, hypophysectomy and electrolyte influence on formation of, 270-272

Atherosclerosis, tissue permeability in, cortisone and hyaluronidase effects on, 293-295

Atherosclerosis
cholesterol-induced
ATP, AMP and heparin in, 374-377
phosphatidyl choline formation capacity in, 49
experimental canine, protein-lipid relations in, 199-201
ovariectomy effects on, 191-192

Atrium, membrane potentials and contractility of rat, 604-611

Atropine
blockade, vasoactivity affected by, 176-177
as defibrillatory agent, 393, 395

Awards, see American Heart Association; Grants

Bacterial endocarditis, prevention of, A.H.A. statement on, 229

v. Bezold-Jarisch effect, drugs eliciting, 363, 372, 373

Bioelectric potentials, generation of, 429-433

Blakeslee Award, 647

Bleeding technic, ultra-rapid, arterial pressure-volume relations studied by, 86-93

Blood, peripheral
postsurgical, 287-288
and splanchnic discharge after acetylcholine, 366

Blood coagulation, platelet factor functions in, 110-115, 515, 516

Blood flow
cerebral, thorium B labeling for study of, 79-84

INDEX OF SUBJECTS

electromagnetic flowmeter for measuring, 39-45
 hepatic, in hemorrhage, 68
 BSP determinations, 67
 peripheral, limb posture changes affecting, 478-482
 pulmonary
 related to pulmonary arteriosclerosis, 154-158
 respiratory role in, 210-213
 reactive hyperemia, 582-586
 resistance to, intraluminal pressure influences on, 358-361

Blood pressure
 arterial
 in hemorrhage, 66-67
 in moderator reflexes elimination, 416-420
 pressure pulses simultaneously recorded, 623-631
 and renal hemodynamic function in heart failure, 254-257
 Digoxin in, 259-262
 volume relationships, in rapid bleeding technic, 86-93
 atrial
 in dinitrophenol poisoning, 35
 pericardial effect on, 134-138
 cardiac output determinations correlated with
 Evans blue method, 506-509
 coronary artery, decreased, and right ventricular
 weakening, 633-637
 flow resistances related to, 358-361
 high, A.H.A. Council for, 117-118, 544
 see also Hypertension
 hypophysectomy plus hormones influencing, 268-269
 intra-arterial, and reactive hyperemia blood flow, 583-585
 low, *see* Hypotension
 meningococcus toxin effect on, 378-383
 pulmonary artery, related to pulmonary arteriosclerosis, 154-158
 and splanchnic activity, 364-367
 hypotensive drugs, 368-373
 ventricular, right, inotropic drug effects on, 448
 wedge
 pulmonary arterial and venous related, 3-6
 pulmonary vein vs. pulmonary venous and atrial
 pressures, 7-11

Blood volume
 carcass vs. visceral, 487-488
 "central," of dog, 1-arterenol in, 385-388
 of leg, human, 486-487
 meningococcus toxin effect on, 380

Book reviews
 Ciba Foundation Symposium on Hypertension (Wolstenholme and Cameron), 116
 Congenital Heart Disease (Abbott), 425
 Shock and Circulatory Homeostasis (Green), 425
 Travaux de L'Institut de Recherches Cardiologiques de Royat (Jourdan), 116
 Verhandlungen der Deutschen Gesellschaft für Kreislaufforschung, 425

Calcium
 as defibrillating agent, 25, 26
 -induced fibrillation, antiarrhythmic agents vs., 474-476
 ouabain-induced arrhythmias affected by, 501-504
 ECG of, 276-278
 serum, in hypothermic fibrillation, 576-578

Capillary permeability, to dextran macromolecules, 594-603

Cardiac arrest, hypothermic, oxygen effect on, 28-31

Cardiac output
 colorimeter for dye method determinations of, 470-471

hypophysectomy plus hormones influencing, 268-269
 measured by iodinated serum albumin, 564-568
 meningococcus toxin effect on, 379-380
 in moderator reflexes elimination, 416-420
 in pregnancy, Evans blue and blood pressure
 methods correlated, 506-509
Cardiac work, ventricular filling affected by, 436-445

Cardiac, *see also* Heart

Chloride, serum, in hypothermic fibrillation, 576

Cholesterol, dietary
 in atherogenesis, 293-295
 phosphatidyl choline formation stimulated by, 47-49

Cholesterol, serum
 vs. connective tissue, 345-349, 520-522
 heparinized, phosphatide and lecithin influence on
 disappearance of, 166-169

Cholesterolemia, hyper-, in ovariectomy, 191-192

Cholic acid, in cholesterol metabolism, 48-49

Choline deficiency, lipoproteins in, 549-551

Cholinesterase, anti-, agents, and fibrillations, 391-393

Cohn's microfractionation method 10, plasma protein-lipid relationships determined by, 194-198

Collateral circulation to lung, after pulmonary artery occlusion, 422-423

Colorimeter, whole blood, for continuous registration of Evans blue concentration, 469-472

Compound F hypertension, salt load test in, 302-303

Congenital heart defects
 A.H.A. manual on, 230
 Atlas of (book review), 425

Cooling, *see* Hypothermia

"Coronary chemoreflex" (v. Bezold-Jarisch effect), drugs eliciting, 363, 372, 373

Coronary perfusion arrest, for defibrillation, 24

Corticotropin (ACTH)
 in electrolyte excretion after hypophysectomy, 267-272
 for myocardial infarction, 496-500

Cortisone
 in altitude endocarditis, 353
 vs. atherosclerosis, 293-295
 in meningococcic hypotension, 381-382
 for myocardial infarction, 499

Cyclopropane-epinephrine arrhythmias, drugs influencing, 291

Denervation, arterial diameter and reactivity after, 618-621

Desoxycorticosterone acetate (DCA)
 and electrolyte excretion, 267-272
 hypertension, salt load test in, 301-302
 and ouabain response of rat, 281-283

Dextran, capillary permeability to macromolecules of, 594-603

Dibenamine, hypotensive action of, 460

Diet, in hypertension, experimental, 73-76
 and periarteritis nodosa, 76-77

β -Diethylaminoethyl diphenylpropylacetate hydrochloride, in cyclopropane-epinephrine arrhythmias, 291

Digitalis, actomyosin unaffected by, 226

Digitoxin, spectrophotometric absorption of, 527, 530

Dinitrophenol (DNP), heart-lung function and O_2 uptake in poisoning of, 32-37

Diphennyldantoin sodium, in cyclopropane-epinephrine arrhythmias, 291

Electric defibrillation, 25, 26

Electrocardiogram
 ambenestyl and procaine amide effects on, 338, 339
 and calcium effect on ouabainized heart, 276-278

in ectopic beats, 541
and epinephrine effect on ouabainized heart, 274-275, 277-278
finite boundaries, effect of, 233, 236
electrolytic tank for plotting, 236-239
images for solution of problems of, 239-241
in interventricular septum excitation, 57-58, 62-63
of normal rat, 281
in ouabain-induced arrhythmias, 502-504
QRS complex
in ouabainized heart, 275-278
and speed of ventricular activation, 409-414
QRS equipotentials, comparison of, 243-250

Electrocardiography
research in (editorial), 231-235
spatial vectors, comparative measurements of, 320-328

Electrolytes
hypophysectomy effect on excretion of in vena cava constriction, 266-272
in hypothermic ventricular fibrillation, 575-578

Electrolytic tank, for field plotting, 236-237
applications of, 237-239

Electromagnetic flowmeter, square wave, for intact blood vessels, 39-45

Endocarditis susceptibility, and polycythemia, 352-355
cortisone in, 353

Epinephrine (adrenalin)
arterial response to after denervation, 618-621
-cyclopropane arrhythmias, drugs influencing, 291
inhibitor-potentiation, in rat mesoappendix bioassay, 121-132
vs. inotropic drugs in ventricular filling, 450-451
myocardial avidity for, 553-558
in ouabainized heart, ECG of, 274-275, 277-278
and vasoactivity, 172-178
and ventricular vulnerability, 142-145

Estrogens, in cholesterol-induced coronary atherosclerosis, 191-192
"et al." (editorial), 547-548

Ether, diethyl, ventricular filling affect by, 449, 450

Ferritin, and vasoactivity, 122, 123, 125, 127, 129-131

Fibrillation
atropine vs., 393, 395
auricular, acetylcholine-induced, 391-395
calcium-induced, antiarrhythmic agents in, 474-476
hypothermic ventricular, electrolytes in, 576-578
ventricular
defibrillating agents, comparison of, 24-27
defibrillation effects of ventricular vulnerability, 150-151
thresholds, relation between ventricular resting excitability and, 143-145
see also Arrhythmias

Filling, right ventricular
inotropic drug effects on, 448-452
work load and heart rate effects on, 436-445

Fournau 933, hypotensive action of, 460

Freon, in pulmonary edema

Glomerular filtration rate (GFR)
hypophysectomy effect on, 269
in right heart failure, 254-257
Digoxin effect on, 260-262

Glucose, in cyclopropane-epinephrine arrhythmias, 291

Glutathione, and vasoactivity, 123, 125

Gold, radioactive colloidal (Au^{198}), disappearance of from circulating blood, method for continuously recording, 14-15, 17-18

Gordon Research Conference on Blood, 229-230

Grants
American Heart Association, 229, 426, 544
Life Insurance Medical Research Fund, 544

Heart
-lung, mechanical, 159-164
muscle, *see* Myocardium
temperature effects on, 24-27
work capacity of, dinitrophenol effect on, 33, 35
see also Cardiac

Heart failure
actomyosin in, 221-227
dinitrophenol, function and O_2 uptake in, 32-37
right, by progressive pulmonary artery constriction, 252-257
Digoxin in, 259-262

Heart Fund campaign, 117

Heart rate
in dinitrophenol poisoning, 35
ventricular filling affected by, 439-445

Heart sound, third, pericardial tensing in, 51-54
characteristics of, 54

Heart volume, in dinitrophenol poisoning, 35

Hemorrhage
arterial pressure in, 66-67
hepatic blood flow in, 68
BSP determinations, 67
hepatic blood O_2 saturation in shock of, 312-314
kidney, in choline deficiency, 550
 O_2 uptake, splanchnic, in, 68-70
vs. total consumption, 70
venomotor tone in, 186

Heparin
cofactor in plasma fractions, 400-401
in experimental arteriopathies, 375, 376
with serum cholesterol, lecithin and phosphatide affecting, 166-169

Hepatic, *see* Liver

Hexamethonium, vs. strophanthin-K, 107

Histamine
-like "H-substance," in reactive hyperemia, 585
and vasoactivity, 122, 123, 129

Hyaluronidase, vs. cortisone in atherogenesis, 294-295

Hydrgine, hypotensive action of, 460-461

Hydrogen ion, in hypothermic fibrillation, 576-578

Hyperemia, reactive, mechanism of, 581-586

Hypertension
arterial, hemidecortication causing, 459-460
treatment of, 460-461
ATP in, 371, 372
book review, 116
diet in experimental, 73-76
and periarthritis nodosa, 76-77
protoveratrine in, 368-369, 371-372
serotonin in, 369-370, 371-372
sodium tolerance in, 297-304, 490
Pitressin effect on, 491-495
see also Blood pressure

Hyperthermia, and atrial membrane potential and contractility, 609-610

Hypoadrenalinism, and ouabain response of rat, 281-283

Hypocalcemia-hypokalemia-ouabain, interrelated cardiac effects of, 501-504

Hypophysectomy, electrolyte excretion affected by, 266-272

Hypotension
hemorrhagic
splanchnic activity in, 365
venomotor tone in, 186
meningococcic, 378-383
see also Blood pressure

Hypothermia
 with dinitrophenol poisoning, O₂ uptake in, 35-36
 of heart
 for defibrillation, 24-27
 O₂ effect on cardiac arrest of, 28-31
 ventricular fibrillation of, electrolytes and pH in, 575-578

Indigo carmine, for dye dilution curves, 570-573

Infarct, *see* Myocardial infarction

Interventricular septum, excitation of, multipolar recording of, 56-64

Iodine, radio-(I¹³¹)
 disappearance of from circulating blood, method for continuously recording, 14-17, 19-23
 serum albumin
 cardiac output measured by, 564-568
 indigo carmine curves compared with, 572, 573
 validating experiments for use of, 483-486

Kidney
 function
 hemodynamic, in heart failure, 254-256
 Digoxin in, 259-262
 hypophysectomy plus hormones in, 268-269
 hemorrhage, in choline deficiency, 550
 hypertension, salt load test in, 300-301
 VEM preparation, and vasoactivity, 122, 123, 125, 126, 128

Lanatoside C, in dinitrophenol poisoning, 32-37

Lasker Award, 647

Lecithin, in disappearance of incubated serum cholesterol, 167-169

Life Insurance Medical Research Fund, award deadlines, 544

Lipid(s)
 -protein relationships
 in atherosclerosis, 199-201
 in dog plasma, normal, Cohn's method 10 determining, 194-198
 serum vs. connective tissue, 344-349, 519-523

Lipoproteins, in choline deficiency, 549-551

Liver
 O₂ saturation in hemorrhagic shock, 312-314
 VDM preparation, and vasoactivity, 122, 123, 124

Lynadryl, with platelet factor 3, prothrombin activation by, 113

Magnesium, serum, in hypothermic fibrillation, 576

Malonate, in ventricular contraction recovery with glucose, 560-561

Marrow, and postsurgical thrombocytogenesis, 287-289

Mecholyl, and vasoactivity, 125

Meningococcus toxin, hypotension of, 378-383

Muscle
 heart, *see* Myocardium
 VDM preparation, and vasoactivity, 123

Myocardial infarction
 ACTH effect on, 496-500
 cortisone effect on, 499
 experimental production of standard predictable, 496-497, 499

Myocardium
 actomyosin quantitative extraction from, 215-219
 and ATP sensitivity, 217-219
 depolarization and repolarization of determined by spatial vectorcardiography, 203-209
 epinephrine and norepinephrine avidity of, 553-558
 protein composition of, normal vs. chronic heart failure, 222-227

Norepinephrine
 myocardial avidity for, 553-558
 and vasoactivity, 172-178
 and ventricular vulnerability, 142-145

Optical density ratios, 529-530

Oubain arrhythmias, calcium and potassium effects on, 501-504

Oubainized heart
 adrenalectomy effect on, 281-283
 DCA effect on, 281-283
 epinephrine and calcium effect on ECG of, 274-278

Ovariectomy, and atherosclerosis, 191-192

Oxygen
 in hypothermic cardiac arrest, 28-31
 saturation
 colorimeter correction for in cardiac output determinations, 471
 of hepatic blood in hemorrhagic shock, 312-314
 with mechanical heart-lung, 162
 of pulmonary vein wedge samples, 11
 uptake, cardiac, in dinitrophenol poisoning, 32-37
 with hypothermia, 35-36
 uptake, splanchnic, in hemorrhage, 68-70
 vs. total, 70

Patent ductus arteriosus, hydraulics in simulated, 613-617

Pericardium, in cardiovascular hemodynamics, role of, 133-138

pH, blood, in hypothermic fibrillation, 576-578

Phenoxybenzamine, vasoactivity in adrenergic blockade with, 175

Phosphatide, in disappearance of incubated serum cholesterol, 166-169

Phosphatidyl choline, cholesterol stimulating formation of, 47-49

Phosphorus, radio-(P³²), disappearance of from circulating blood, method for continuously recording, 14-15, 17

Pitressin
 hypertensive sodium tolerance affected by, 491-495 and vasoactivity, 123, 125, 129

Platelets
 factors of, specific properties of in coagulation, 110-115, 515, 516
 postsurgical, 287-288

Polyarteritis nodosa, etiology of rat, 76-77

Polyctyhemia, and endocarditis susceptibility, 352-355

Posture, limb, peripheral blood flow affected by, 478-482

Potassium
 as defibrillating agent, 25, 26
 ouabain-induced arrhythmias affected by, 501-504
 radioactive (K⁴²), disappearance of from circulating blood, method for continuously recording, 14-15, 17-18
 serum, in hypothermic fibrillation, 576-578

Pregnancy, cardiac output in, 506-509

Pressures, *see* Blood pressure

Procaine amide
 antiarrhythmic effects compared with ambenestyl, 336, 338-341
 in calcium-induced arrhythmias, 475, 476
 dangers of, after cardiac glycosides, 108
 vs. strophanthin-K, 106-107

Protein
 -lipid relationships
 in atherosclerosis, 199-201
 in plasma, Cohn's method 10 determining, 194-198
 myocardial, normal vs. chronic heart failure, 222-227

quantitative determination of in heart, 454-457
 serum vs. connective tissue, 520, 522

Prothrombin
 activation
 by platelet factor 1, 111-112
 by platelet factor 3 with Lynadryl, 113
 thrombin in, 113
 serum, conversion accelerator (SPCA) plasma, coagulation mechanism in, 514-517

Protoveratrine, hypotensive action of, 368-369, 371-372

Pulmonary edema, antifoaming agents in, 510-513

Pulmonic stenosis, right heart failure studies in, 256-257

Quinidine
 in calcium-induced arrhythmias, 475, 476
 dangers of, after cardiac glycosides, 108
 vs. strophantidin-K, 103-106

Radioactive tracers, *see specific elements*

Rat mesoappendix bioassay, as vasoactivity indicator, 121-132

Registry of Cardiovascular Pathology, 544-545

Regurgitation, ventriculo-atrial, pericardium preventing, 136

Renal, *see Kidney*

Renin, and vasoactivity, 123, 125, 128

Research
 in electrocardiography (editorial), 231-235
 prelude to (editorial), 317-319

Respiration, role of in pulmonary blood flow and venous return, 210-213

Rheumatic fever
 "Jones Criteria (Modified) for Guidance in Diagnosis of," 646
 prevention of, A.H.A. statement on, 229

Sarin, as anticholinesterase agent, 390, 391, 392
 SC-2919, -3323, -3412, -3755, -3920, in calcium-induced arrhythmias, 475-476

Serotonin, hypotensive action of, 369-370, 371-372

Shock
 and circulatory homeostasis (book review), 425
 hemorrhagic, *see Hemorrhage*
 of meningococic hypotension, 378-383
 normovolemic, venomotor tone in, 186-187

Silicone aerosol, in pulmonary edema, 510-513

Sodium
 excretion, hypophysectomy plus hormones influence, 266-269, 271-272
 pentobarbital, ventricular filling affected by, 449, 450-451
 radio- (Na^{22}) , total tissue sodium determined by, 330-333
 radio- (Na^{24}) , disappearance from circulating blood, method for continuously recording, 14-15, 17
 retention, in heart failure, 254-256
 Digoxin in, 259-262
 serum, in hypothermic fibrillation, 576
 thiopental, ventricular filling affected by, 449, 450-451
 tolerance, in hypertension, 297-304, 490
 Pitressin effect on, 491-495
 total tissue determination, 330-333

SPCA, *see Prothrombin*

Splanchnic nerve activity, blood pressure and, 364-367
 hypotensive drugs in, 368-373

Stereovector electrocardiograph (SVEC)
 spatial ECG vectors measured by, 320-328

speed of ventricular activation measured by, 409-414

Strophantidin-K
 vs. hexamethonium, 107
 vs. inotropic drugs in ventricular filling, 449-451
 vs. procaine amide, 106-107
 vs. quinidine, 103-106

Surgery
 Cardiovascular, International Symposium on, 118
 and thrombocytogenesis, 285, 287-289

Sympathectomy, limb posture changes affecting blood flow in, 481

Sympathin, *see Epinephrine; Norepinephrine*

Systoles, premature ventricular, excitation spread during, 535-541

Tabun, as anticholinesterase agent, 390, 391, 392, 393

Temperature, heart, and fibrillation, 24-27
 see also Hypothermia

Tetraethylammonium bromide, hypotensive action of, 460

Thorium B, cerebral blood flow studied by labeled, 79-84

Thromone activity, platelet factor 3 in, 114

Thrombin, anti-
 as anticoagulant, 401
 measurement of, 398-399
 preparation of concentrates, 399-400
 see also Prothrombin

Thrombocytogenesis, after surgery, 285, 287-289

Vasoactivity
 rat mesoappendix bioassay of with biologic materials, 122-132
 terminology of, new, 121

Vectorcardiography
 different results from different leads in, significance of, 532-534
 myocardial depolarization and repolarization determined by, 203-209
 spatial vectors, comparative measurements of, 320-328
 see also Stereovector electrocardiograph; Zero of potential

Vena cava, thoracic inferior, constriction of, ascites production and electrolyte excretion in, 264-272

Venomotor tone, in hemorrhage and shock, 181-189

Venous return, respiratory role in, 210-213

Ventricle
 contraction of, energy sources for, 559-563
 function, pericardial effects on, 135
 length-circumference relations of left, 639-643
 strength of right dependent on coronary artery pressure, 633-637
 volume curves, left, method for recording, 588-593
 vulnerability, 141-146, 147-149
 defibrillation effects on, 150-151
 epinephrine and norepinephrine effects on, 142-145
 wall of, properties during filling, 443
 with inotropic drugs, 451-452
 see also Filling

Veratridine, spectrophotometric absorption of, 527-528, 530

Weber's solution, 215

World Congress of Cardiology, Third (1958), 647

Zero of potential, adjusting Wilson central terminal to in human, 94-101